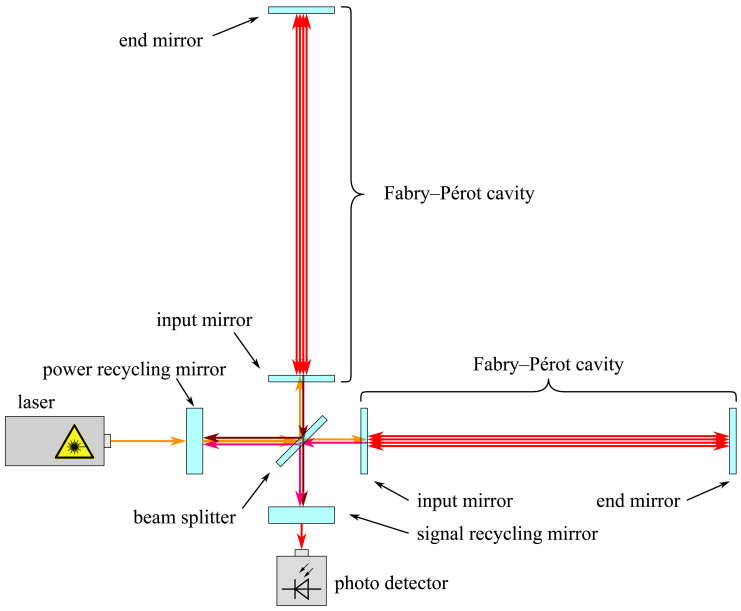
5.5: Other Methods of Studying Space

While electromagnetic radiation remains the most important tools for study planets and stars, scientists have additional tools that use other means to study space.

5.5.1 LIGO

The Laser-Interferometer Gravitational Wave Observatory (LIGO) uses to two lasers fired into an L-shaped configuration. Originally designed and built by Caltech and MIT, the two LIGO observatories are in Hanford, Washington and Livingston, Louisiana. By looking for minute deviations in the alignment of the two lasers at each site, LIGO can detect gravity waves. On February 11, 2016, the operators of LIGO published a paper reporting their first successful detection of gravity waves caused by the merger of two black holes 1.3 billion light years away.



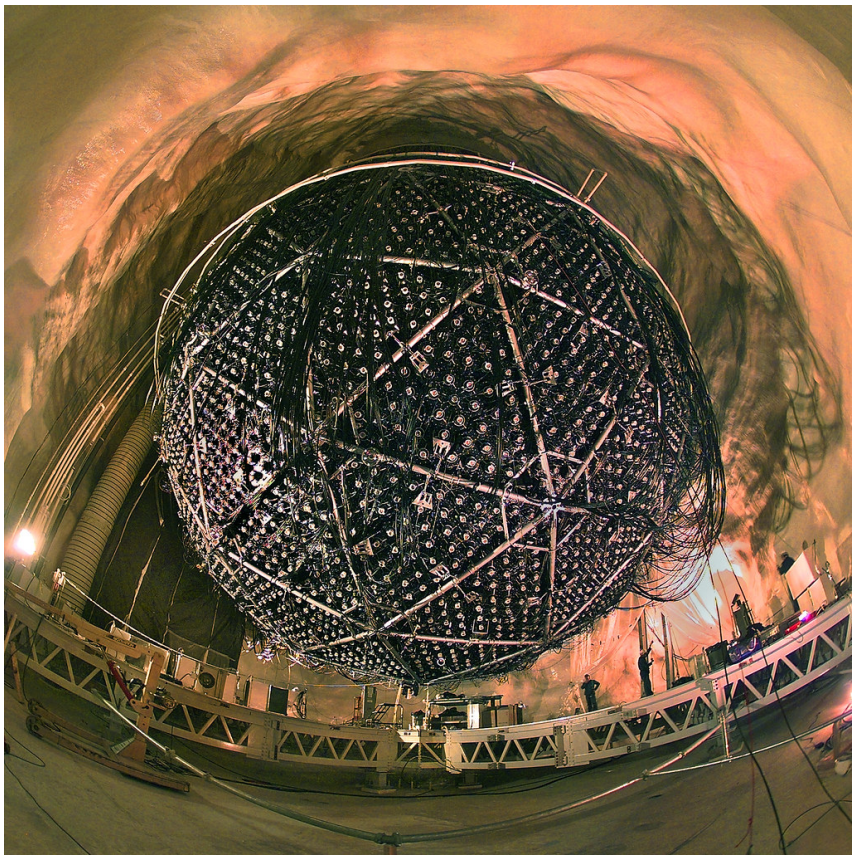
LIGO uses two laser beams to detect gravity waves.

https://commons.wikimedia.org/wiki/F...simplified.svg

5.5.2 Neutrino Detectors

Nuclear fusion and other reactions produce tiny particles called neutrinos. Neutrinos, however, interact very weakly with matter. Billions pass through the Earth every second without interacting with a single atom. This weak interaction makes them hard to

detect and neutrino detectors require a large field to detect even a single particle. A typical neutrino detector contains 1,000 tonnes of water or a fluid containing chlorine that must be continuously monitored for tiny flashes that could indicate a neutrino detection.



Sudbury Neutrino detector.

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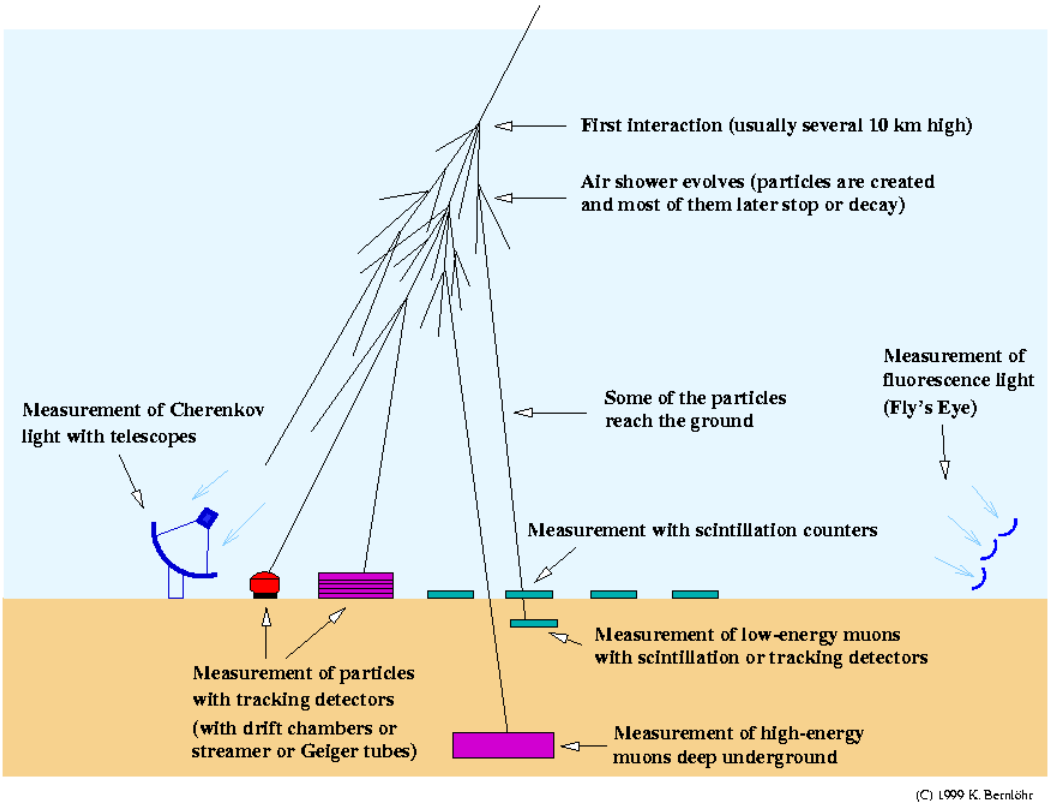
5.5.3 Cosmic Rays

Cosmic rays, charged particles from deep space, can also be studied. Most cosmic ray detectors look for the “showers” of radiation that come from cosmic rays interacting with the upper atmosphere. Scientists also use space-based detectors, such as those on board the International Space Station, to study cosmic rays.



Cosmic Radiation Detection.

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